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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/836,372	04/18/2001	Takashi Shirasuna	35.G2775	6886

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EXAMINER

JUBA JR, JOHN

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 01/31/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/836,372

Applicant(s)

SHIRASUNA, TAKASHI

Examiner

John Juba

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

Applicant's assistance is invited in identifying the correct publication number for the prior art four unit zoom lens system discussed on Page 2, line 13. Japanese publication number 06-260088 cited in the specification and Applicant's I.D.S. appears to be directed to a manufacturing apparatus, rather than a zoom lens system.

Specification

The disclosure is objected to because of the following informalities. Appropriate correction is required:

Applicant's use of the variable " ϕL_i " is somewhat inconsistent. On Page 15, at criterion (A-2), this variable is identified as being the total power of the i^{th} lens unit, including refractive and diffractive contributions. On Page 21 (line23), this variable is identified as being solely the total *diffractive* power of the i^{th} lens unit. Turning to claim 4, this variable appears to relate to the collective power of the first, second, and fourth lens units. Turning to claim 27, this variable appears to relate to the collective power of

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the first, second, third, and fourth lens units. Applicant's assistance in resolving this issue would be appreciated.

The examiner would like to verify that the values stated for the phase coefficient C_1 in the second and third numerical examples are intended to be positive. Given the expression for optical power of the diffractive optical element (Pg. 12, line 12), positive values of C_1 in the first lens group do not satisfy the criterion (A-2) taught on Page 15. It is acknowledged that the criterion is satisfied in the fourth lens group.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 34 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 34 recites a Markush group that includes embodiments having a diffractive element in the second lens unit, or in the third lens unit. "*Markush* claims must be provided with support in the disclosure for each member of the *Markush* group". [MPEP 608.01(p). Speculation that inclusion of a diffractive element in the second or third lens unit can serve to correct lateral chromatic element is not sufficient to support a claim for such an embodiment. One of ordinary skill would not be able to practice these claimed

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inventions without designing the entire lens system. Such an endeavor would constitute undue experimentation.

Claims 4, 16, 19, 20, and 27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Each of claims 4, 16, and 27 is confusing or incorrect as to the meaning of "entire i-th lens unit". The recitation of the entire i-th lens unit as comprising the first, second, and fourth, or first, second, third, and fourth lens units collectively is believed to be incorrect. Rather, it is believed that "the entire i-th lens unit" is intended to be the collection of all optical elements, both refractive and diffractive, in the i-th lens unit. In claim 4, it is especially unclear why the "first, second, and fourth" lens units may be associated with values of $i = 1, 2, \underline{3},$ and 4.

Claim 19 is believed to be incorrect in referring to the "second step" as comprising three refracting steps. The second step of the base claim is believed to rely upon the second lens unit, which includes a single lens element. It is believed that the claim should refer to the third step. Claim 20, which further limits the third step, is rejected to as depending from claim 19.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 - 5, 7, 8, 10 - 17, 19, 20, 22 - 28, 30, 31, 33, and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Nishio (U.S. Patent number 5,978,153 to Canon, K.K.). Referring to the fourth embodiment shown in Figure 4, the associated table in Col. 11, and the associated text, Nishio disclose a method of correcting lateral chromatic aberration (Col. 7, lines 63-67) comprising the recited steps performed by employing a lens system “comprising” four moving groups $L_1(+)$, $L_2(-)$, $L_3(+)$, and $L_4(-)$. The circularly symmetric diffractive element (Col. 7, lines 3-8) is used in the first group.

With regard to claims 4, 16, and 27, the first group collectively has positive power, the diffractive element in this group has positive power (C_1 on r_3 is negative), and the relation is satisfied.

With regard to claims 5, 17, and 28, the first group has a positive element over d_2 and a negative element over d_1 .

With regard to claims 7, 8, 19, 20, 30, and 31 the third group L_3 has a positive element over d_{16} , a positive element over d_{18} , and a negative element over d_{15} , with the elements over d_{15} and d_{16} forming a bonded lens.

With regard to claims 10, 22, and 33, the diffractive element is a lamination of differently refractive materials, as shown in Figure 68, and discussed in Column 15 (lines 53+).

With regard to claim 12, Nishio disclose that this embodiment is used in a camera (Col. 16, lines 39+).

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Claims 1, 4 - 7, 9, 11 - 13, 16 - 19, 21, 23, 24, 27 - 30, 32, and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Hayashi, et al (U.S. Patent number 6,002,519). Referring to the first embodiment of Figure 1, associated text in Column 5 (lines 39 - 67), and data in Table 1, Hayashi, et al disclose a method of correcting lateral chromatic aberration (Col. 3, criterion (1)) comprising the recited steps performed by employing a lens system comprising four moving groups Gr1(+), Gr2(-), Gr3(+), and Gr4(-), with a diffractive element disposed in the second.

With regard to claims 4, 16, and 27, the second group collectively has negative power, the diffractive element in this group has negative power (C_1 on r_8 is positive), and the relation is satisfied.

With regard to claims 5, 17, and 28, the first group comprises at least a positive element over d_3 and a negative element over d_1 .

With regard to claims 6, 18, and 29, the second group Gr2 "comprises" only one negative lens spanning d_7 .

With regard to claims 7, 19, and 30 the third group Gr3 comprises a positive element over d_{14} , a positive element over d_{16} , and a negative element over d_{12} .

With regard to claims 9, 21, and 32 the fourth group Gr4 comprises a positive element over d_{20} , a negative element over d_{18} , and a negative element over d_{22} .

With regard to claim 12, Hayashi, et al disclose that this embodiment is used in a hand-held camera (Col. 1, lines 6-14).

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Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Yamamoto, et al (U.S. Patent number 6,236,515 B1) disclose a four-unit zoom system (+)(-)(+)(-), four groups moving, with a diffractive surface in the fourth group (twenty-third embodiment; Fig. 86, Table 27).

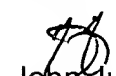
Tanaka (U.S. Patent number 6,094,314) disclose a four-unit zoom system, four groups moving, the second group being a single negative lens, and a diffractive optical element in the fourth group, the arrangement being (+)(-)(+)(+).

Yamanashi (U.S. Patent number 6,094,313) disclose a four-unit zoom system (+)(-)(+)(-), four groups moving, and suggest the inclusion of a diffractive optical element.

Canon, K.K. (EP 0 913 718 A2) disclose a zoom system comprising a diffractive optical element, and teach stacked gratings of materials having different refractive indices.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Juba whose telephone number is (703) 308-4812. The examiner can normally be reached on Mon.-Fri. 9 - 5.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


John Juba
January 24, 2002


Cassandra Spyrou
Supervisory Patent Examiner
Technology Center 2800